Tool Safety

Hand Tools

Portable Power Tools
&
Stationary Power Tools

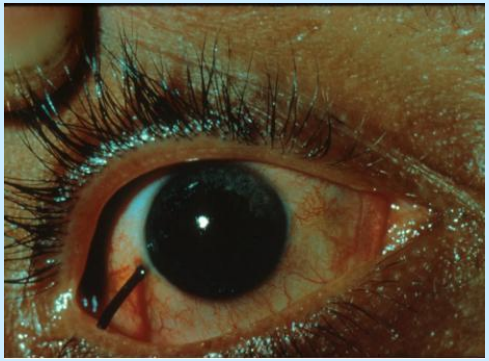
OSHA Standards

29 CFR 1910.241-244 & 1926. 300-307

Regulate Hand and Portable Power Tools

Hazard Awareness

Electrical Burn



Flying Particles

Cut or Falling Object

Electrical Shock

WRONG !

- **Failed to Wear Eye Protection**

WRONG !

- **Failed to Wear Eye Protection**
- **Wrong Tool for the Job**

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- **Failed to Wear Eye Protection**
- **Wrong Tool for the Job**
- **Right Tool Used Improperly**

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- **Poor Maintenance**

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- **Exceeded Tool's Capability**

WRONG !

- **Failed to Wear Eye Protection**
- **Wrong Tool for the Job**
- **Right Tool Used Improperly**
- **Poor Maintenance**
- **Exceeded Tool's Capability**
- **Striking**

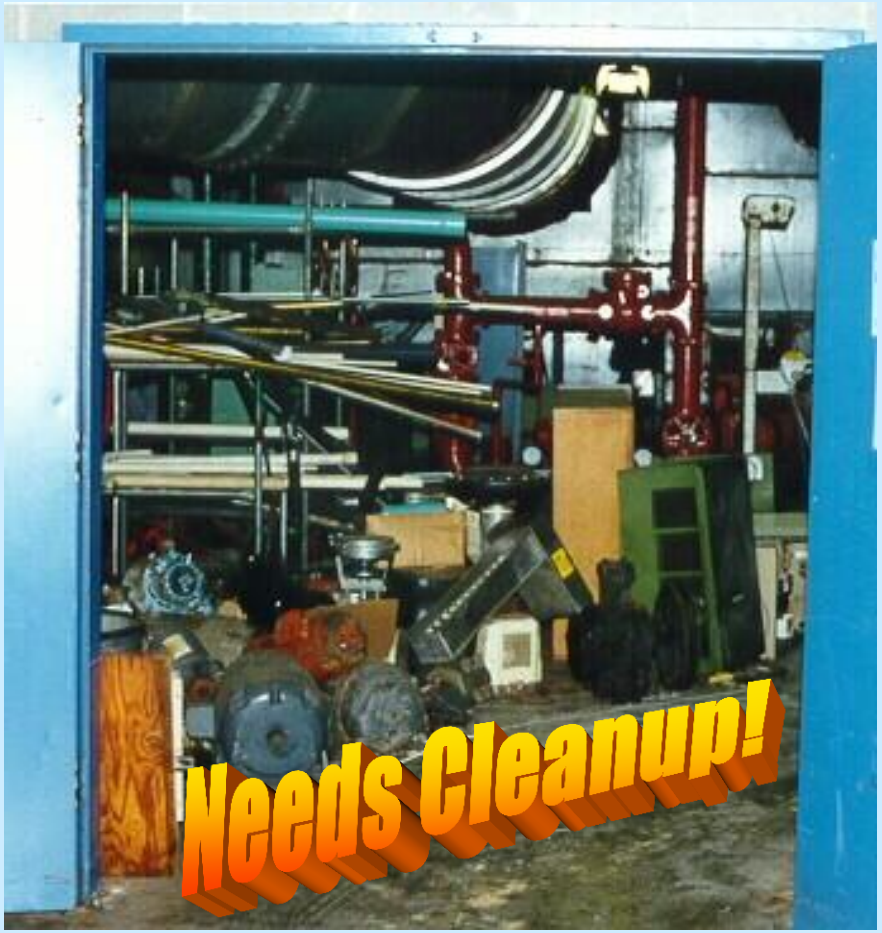
General Safety Precautions

- **Operate Tools According to Manufacturer's Instructions**
- **Select Right Tool**
- **Wear PPE**
- **Keep all Tools in Good Condition**
  - **DO NOT USE DAMAGED TOOL**

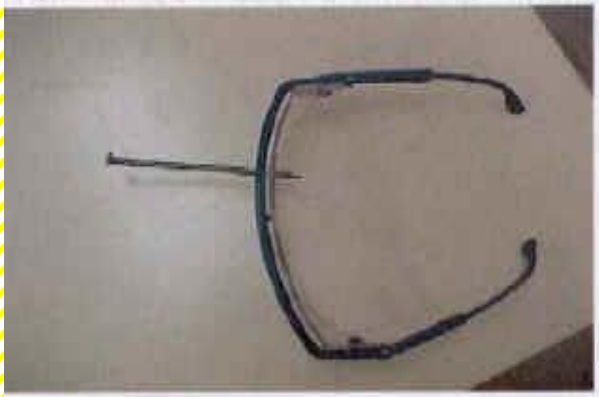
General Safety Precautions

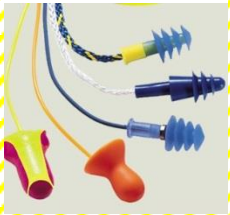
Tools and your Work Areas (Benches, Floors, etc.) should be kept clean and dry. When not in Use, Store Your Tools

– Prevents Accidental Slips, Trips and Falls



General Safety Precautions





Safety 101

Recommended:
Safety Goggles or Glasses
& Appropriate Other PPE

Hand Tools = Manually Powered

Greatest Hazards =

- Misuse
- Improper Maintenance

Screwdriver

Choose Right Type & Size

- Slotted, Philips, Hex, Torx, etc.

Star (Torx)

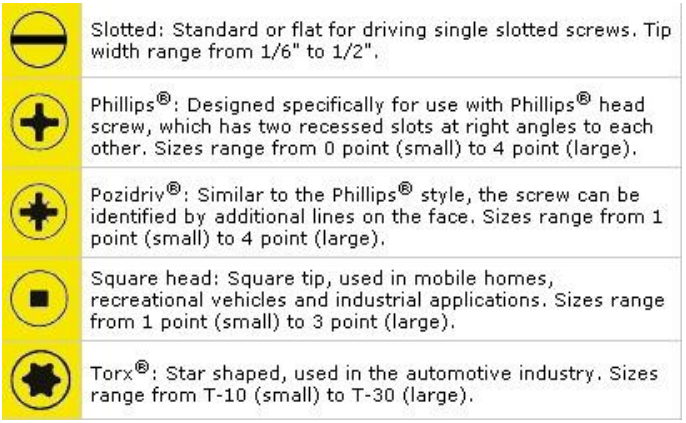
Used to Drive or Remove Screws

- Do Not Use for Prying, Punching, Chiseling, Scoring or Scraping

Hex (Allen)

Do Not:

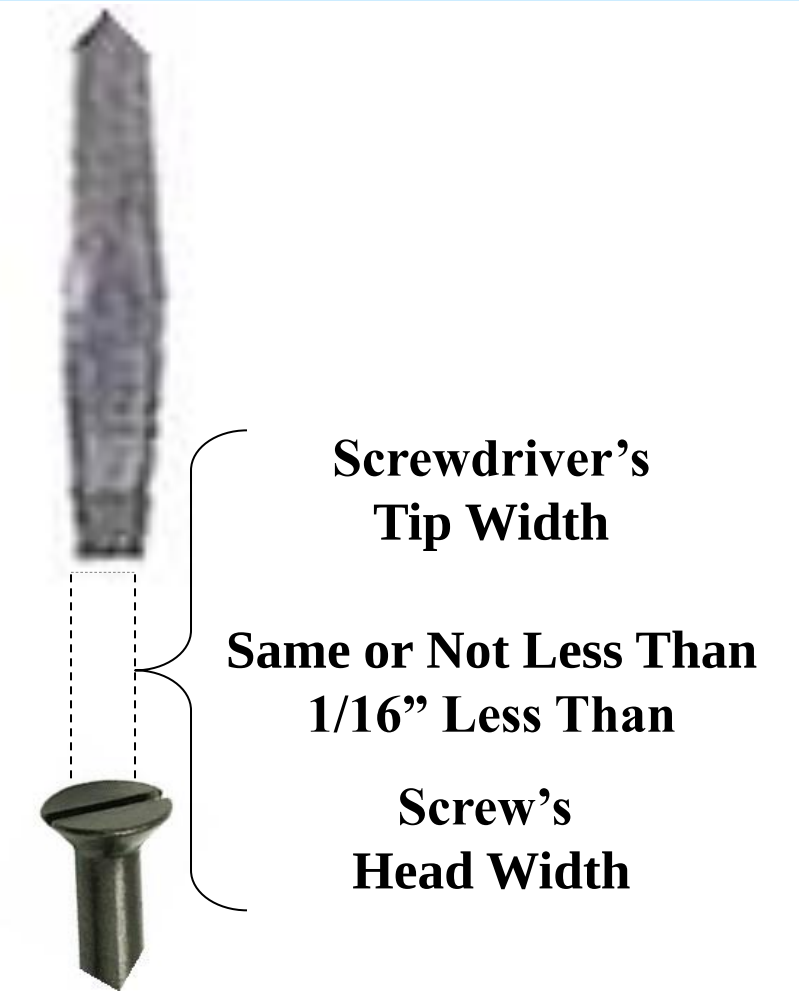
- Strike with Another Tool (Use as a Chisel / Punch)
- Use with Rounded Tip
- Use Split/Broken Handle
- Use Near Live Wires / Check Electrical Current
- Use Pliers for Leverage (Wrench OK on Square Shank)
- Expose to Excessive Heat



Screwdriver

<u>Good Procedure</u>:

- **Fit Tip to Slot**

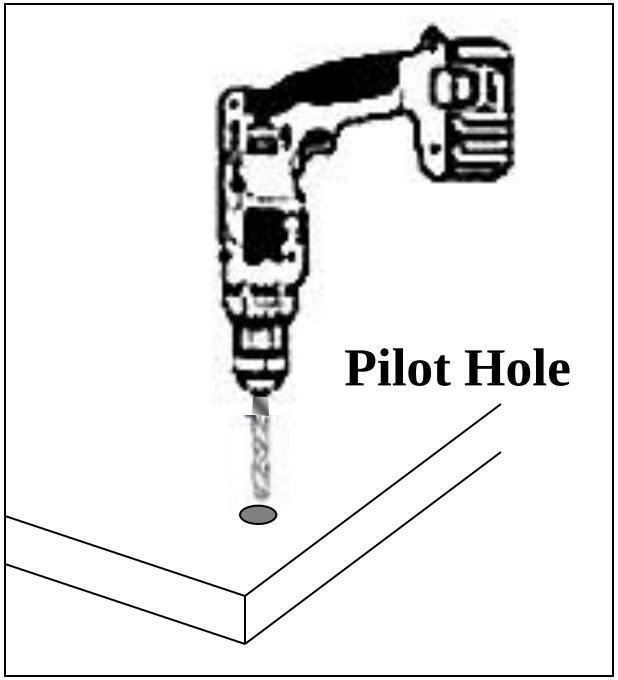


Screwdriver

<u>Good Procedure</u>:

- **Drill a Pilot Hole Before Driving Screw**
  - **Hardwood**
  - **Near Edge**
- **Apply Wax**
- **Repair / Discard Damaged Tool**

Wear Protective Eyewear



Need Assorted Sizes & Types

Pliers

Choose Right Type & Size

Over 125 Different Types
(slip joint, long nose, flat nose, cutting, locking, ….)

Used to Grip, Turn, Bend or Cut

<u>Do Not</u>:

- **Strike with Another Tool or Use as a Hammer**
- **Use for Cutting Hardened Wire**
- **Rock From Side to Side or Bend the Wire Back and Forth Against the Cutting Blades (Always Cut at Right Angle)**
- **Use an Extender for Greater Leverage (Get a Larger Pliers or Bolt Cutter)**

Plastic Covered Pliers DO NOT Protect from Electrical Hazards

Wear Eye Protection

Insulated Tools

Wear Eye Protection

Hazard of Electrical Shock Requires

- **LOTO**
- **Insulated Tools**

1000 V

UL - Listed
ASTM F1505-01
IEC 60 900
NFPA 70E
OSHA 29 CFR 1910.335

Non-Spark Tools

Flammable / Explosive Work Environment
Requires Spark Resistant Tools

- Brass, Plastic, Aluminum, Alloys, Wood

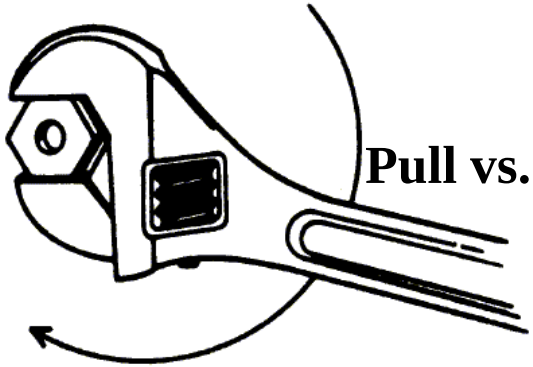
Characteristics

- Less Strength
- Easier to Damage
- Wear Out Quicker
- More Frequent Maintenance

Wear Eye Protection

Wrenches

Main Function – Holding & Turning Nuts, Bolts, Plugs , Other Threaded Parts



Pull vs. Push

USE:

- Opening Exactly Fits
- Pull
- Frozen Nut - Penetrating Oil & Striking Face

Not Use:

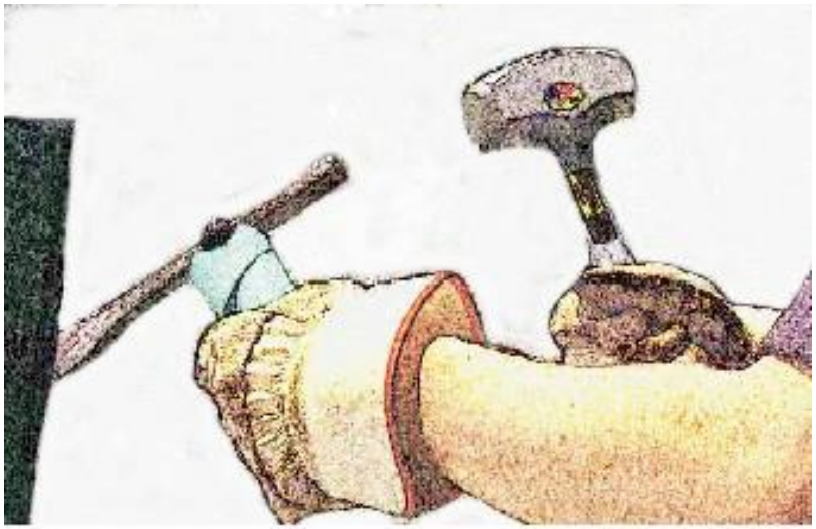
- Extender Bar
- As Hammer

Wear Eye Protection

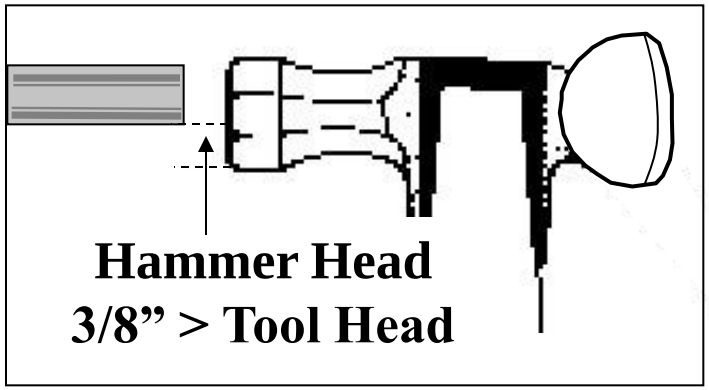
Striking Tools

Chisels, Punches, Star Drills, Wedges

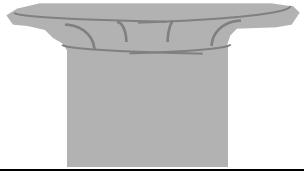
- **Use Light Sledge or Ball Pein Hammer**
- **Use Tool Only for its Designed Job**
  - **Chisel – Cut (Metal, Wood, Brick & Block)**
  - **Star Drills – Holes in Brick, Concrete, Stone**
  - **Punch – Make Holes, Drive/Remove Pins, Alignment**



Striking Tools



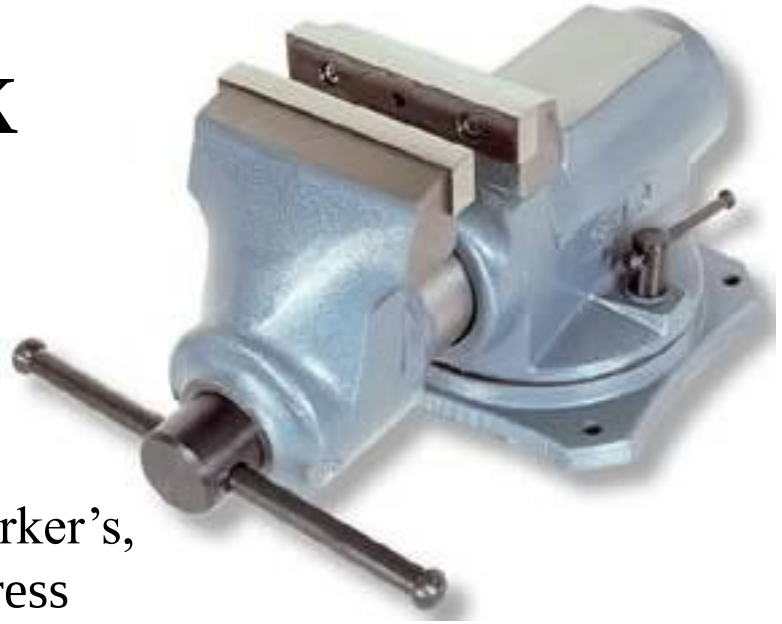
Mushrooming Head



Wear Eye Protection

Tap - Tap

Secure Work



Select Right Vise:

Machinist's, Utility,
Mechanic's, Woodworker's,
Pipe, Milling, Drill Press

Mount with Bolts (Not Screws)

PROCEDURES:

- Stationary Jaw Project Beyond Workbench
- Not an Anvil
- Tighten Handle with Hand Pressure Only
- Use a Liner to Protect Work

Wear Eye Protection

Secure Work

Select Right Clamp:

- C-Clamp, Spring Clamp, Hand Screw Clamp, Web Clamp, Miter Clamp, and more …
- Opening Size, Depth, Strength, and Weight

Purpose: Temporarily Hold Work

PROCEDURES:

- Use Enough to Hold Job
- Use Pads to Protect Work
- Do Not Overload
- Keep On Rack When Not In Use

Wear Eye Protection

TOOL STORAGE:

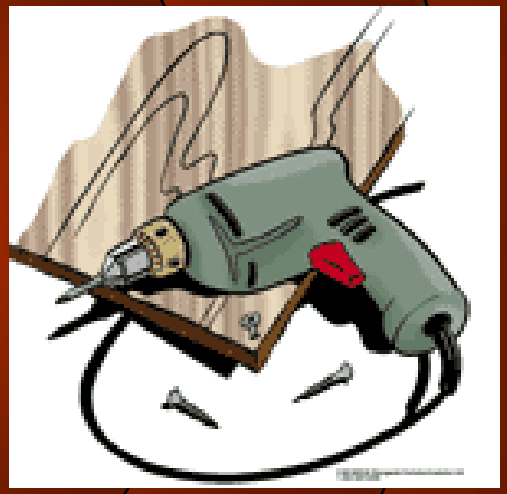
- Tool Box
- Tool Belt
- Tool Wall
- Tool Cabinet
- Tool Storage Room

Purpose:

- Protect Tools
- Secure Tools
- Have Tools at the Ready

End - Hand Tools

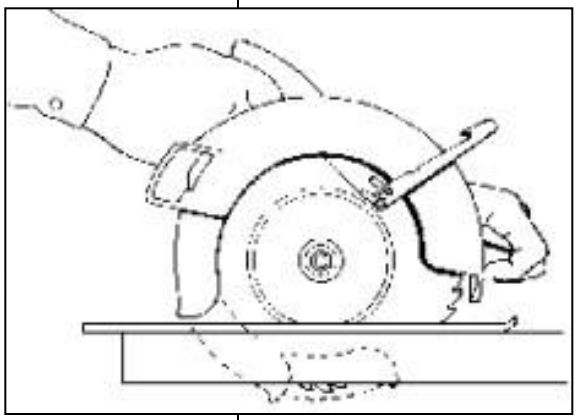
NEXT



Power Tool Safety

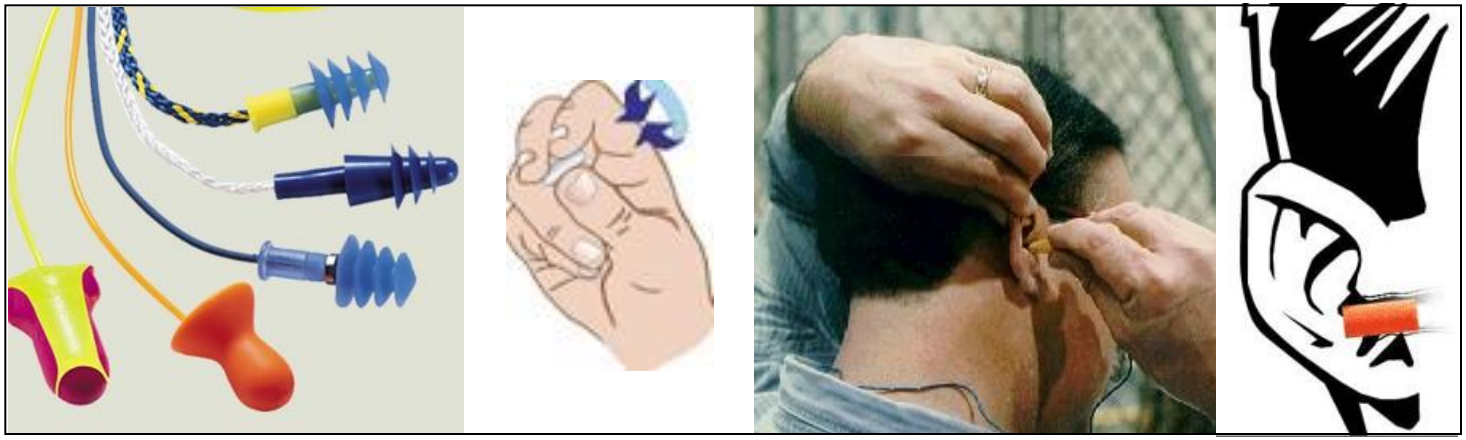
Portable & Stationary Power Tools

Portable & Stationary Power Tools

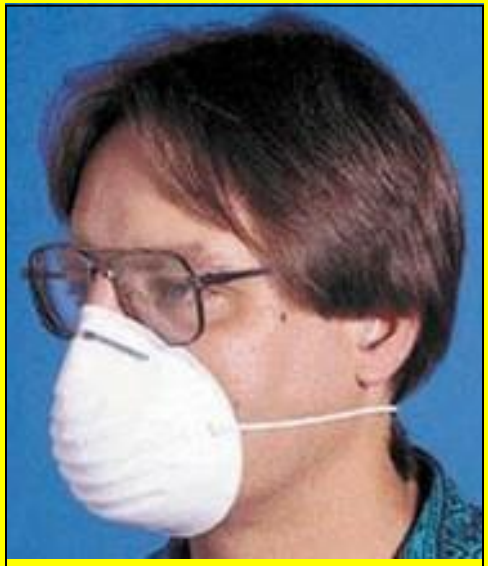


Portable & Stationary Power Tools

Portable & Stationary Power Tools



Portable & Stationary Power Tools



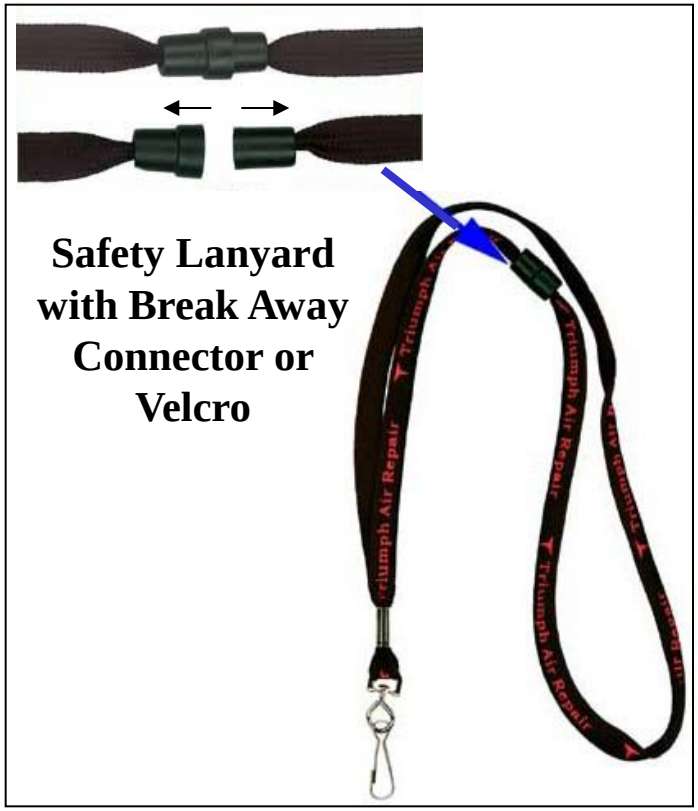
Dust Mask

Respirator

It Can Get Caught:

- Long Hair – Needs to be Restrained
- Jewelry (Chains, Necklaces & Rings)
  - Best Not Worn
  - Also Shock Hazard
- Loose Clothing
- Dangling Objects (ID Badge Lanyard)

Prosthetic Thumb for Amputation

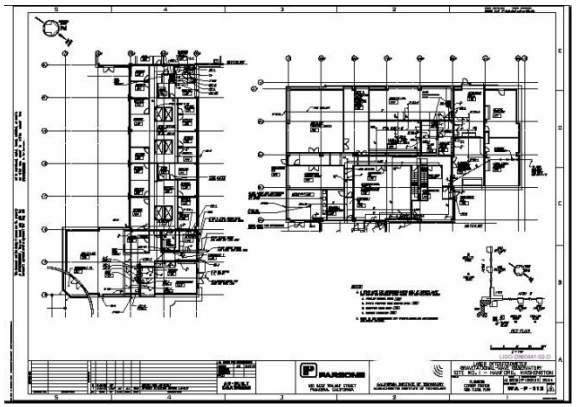


GENERAL PRECAUTIONS:

- Avoid Accidental Starting
  - Carry Tool by the Handle (Not Hold Finger on the On-Switch) While Carrying a Plugged-In Tool
- Protect Cords and Hoses From Damage
  - Keep Away From Heat, Oil & Sharp Edges
  - Disconnect at Receptacle Plug or Hose Connector
    - Do Not Yank Cord / Hose
- Keep Observers at a Safe Distance From Work Area
- Keep Good Footing and Balance
- Secure Work With Clamps / Vise
  - Frees Both Hands

GENERAL PRECAUTIONS: (cont.)

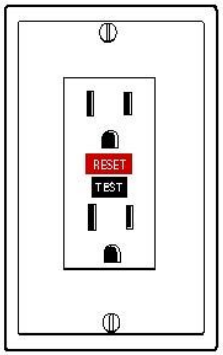
- Know Location of Utilities & Other Hazards
- Disconnect When
  - Not In Use
  - Servicing
  - Changing Accessories
- Tools Should Be Maintained
  - Kept Sharp for Performance
  - Follow User's Manual
- Do Not Use Damaged Tools
- Proper Storage



GENERAL PRECAUTIONS: (cont.)

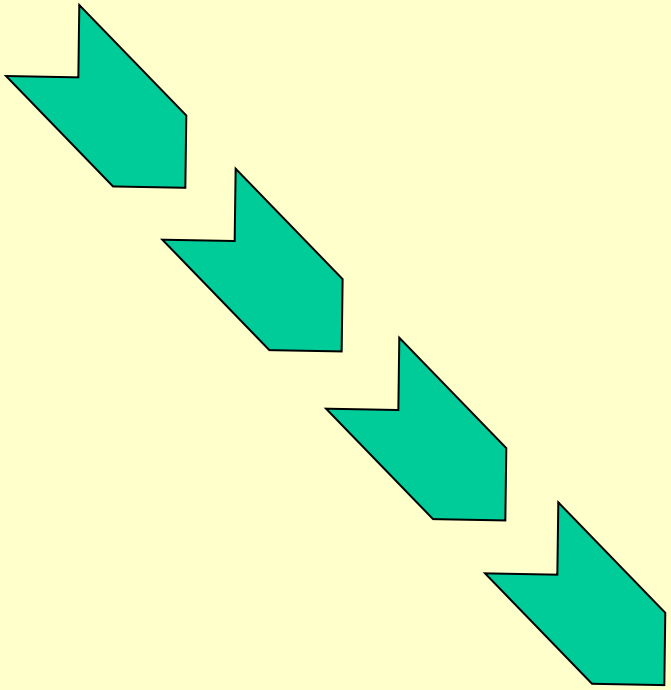
Electric Tools Pose Burn and Shock Hazards

- Must be Grounded Unless Double Insulated
- Use GFCI in a Damp Atmosphere



Ground Fault Circuit Interrupters

GENERAL PRECAUTIONS



SPECIFIC TOOLS

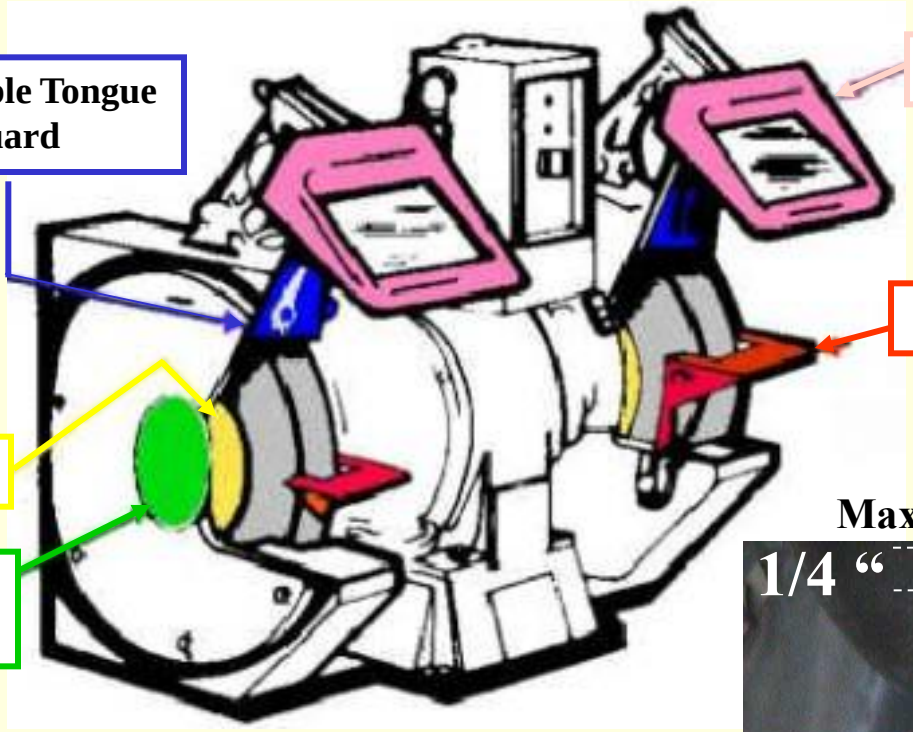
Powered Abrasive Wheels

- Hazard –
  - Parts Moving at High Speed
  - Flying Fragments
- Inspect Wheel
  - Maximum Speed
  - Ring-test **(No Cracks or Defects)**

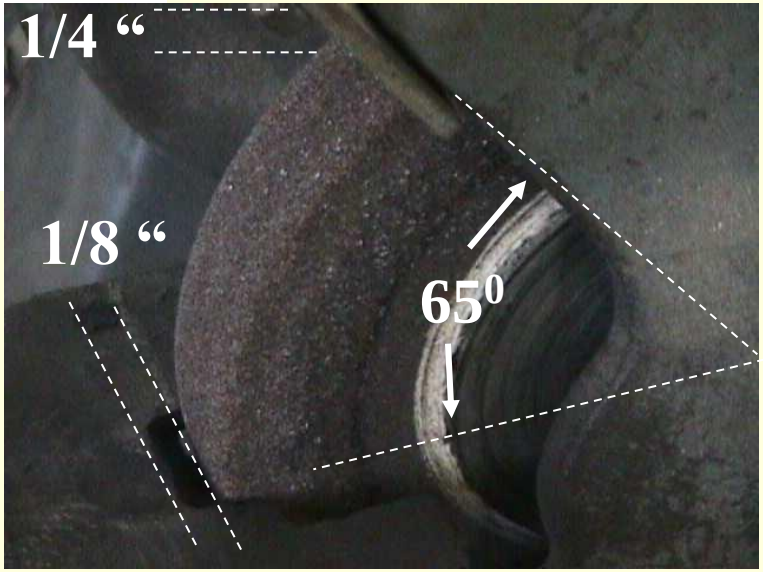
Cracked Wheel
(Spindle guard removed for better viewing)

29 CFR 1910.215 & .243

Powered Abrasive Wheels



Max 1/4”Between Wheel & Tongue



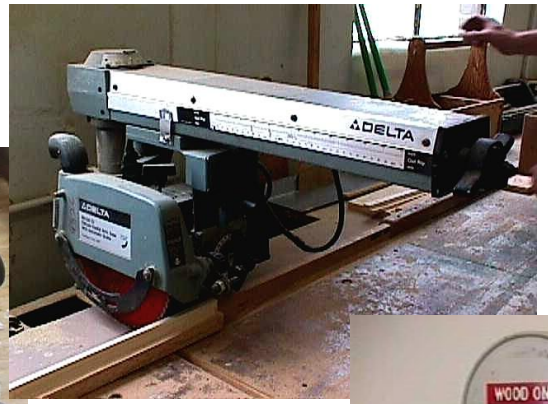
Max 1/8”Between Wheel & Work Rest

SAWS - Potential Hazards

Point of Operation - Contact with moving blade

Protection:

- **Blade Guards**



SAWS - Potential Hazards

Point of Operation - Contact with the turning blade

Protection:

- **Blade Guards**
- **Hand Position**
- **Push Sticks**

SAWS - Potential Hazards

Point of Operation - Contact with the turning blade

Protection:

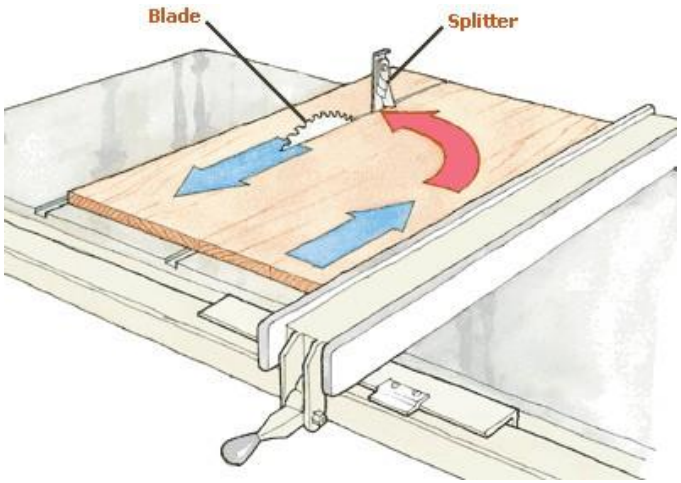
- **Blade Guards**
- **Hand Position**
- **Push Sticks**
- **LOTO**
  - **Remove Jam**
  - **Repair**
  - **Cleaning**

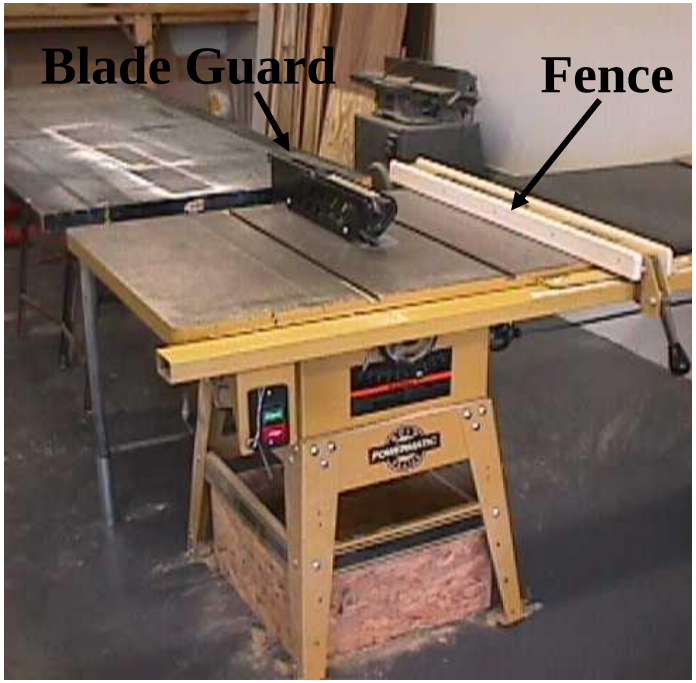
SAWS - Potential Hazards

Kickback – stock is thrown back at operator

Protection:

- **Keep Blade Sharp**
- **Adjust Blade Height**
- **Use Safeguards**
  - **Spreader (Splitter)**
  - **Anti-Kickback Fingers**
  - **Gauge / Rip Fence**





SAWS - Potential Hazards

Feed Tables

Work Supports

BAND SAW

Pulley Guard

Adjustable Guard
(Blade Guide Post)

Vertical

Hand-Held

Horizontal

Scroll Saw

Jig Saw

Portable Circular Saws

CHECK:

- **Switch**

Portable Circular Saws

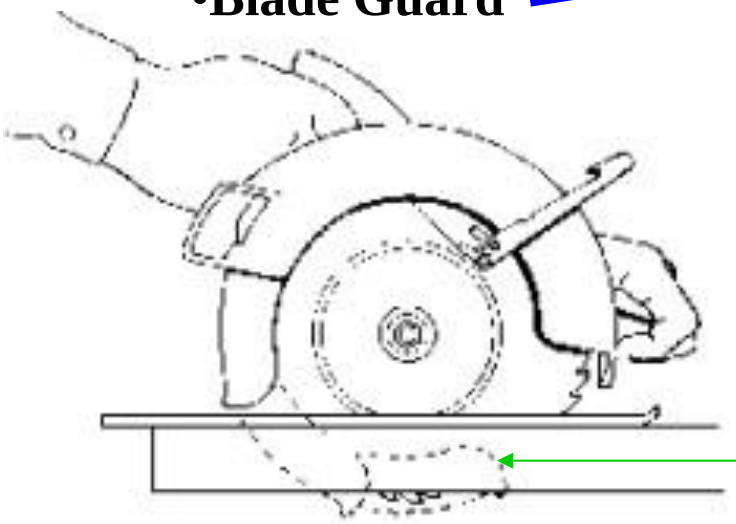
CHECK:

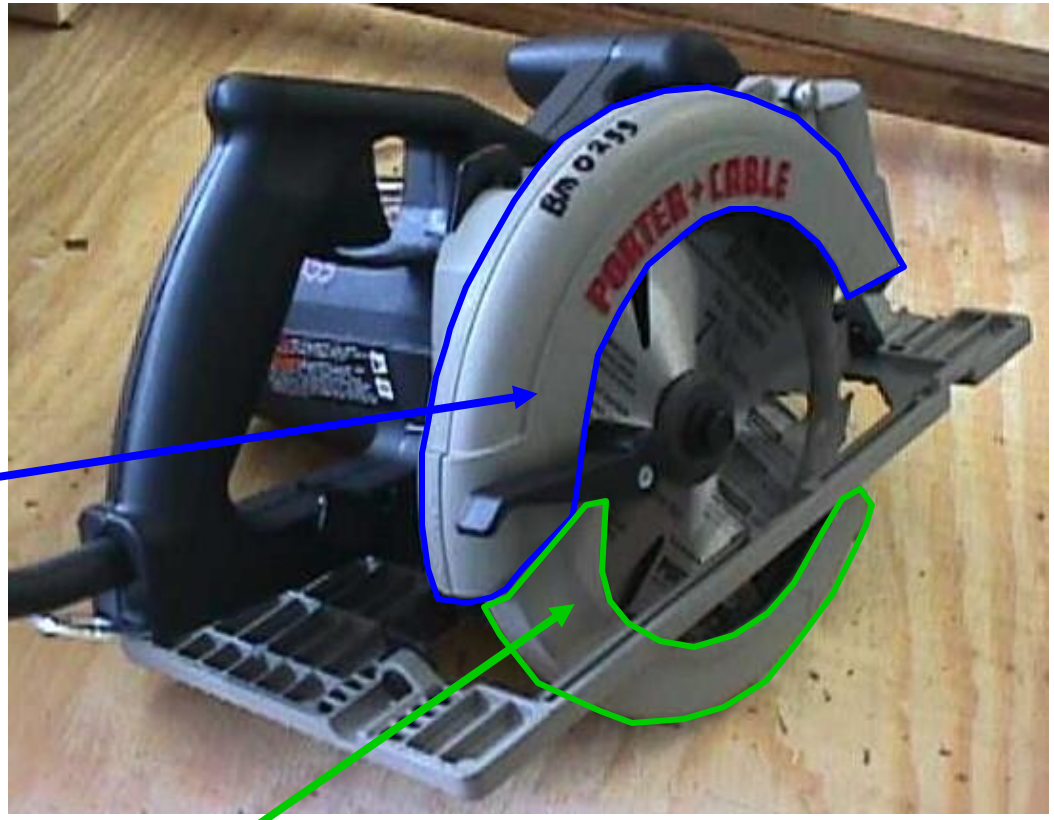
- Switch
- **Blade**
  - **Sharp**
  - **Type & Size for Application**

Portable Circular Saws

CHECK:

- Switch
- Blade
  - Sharp
  - Type & Size for Application
- **Blade Guard**





Retractable Blade Guard

NEVER DEFEAT SAFETY GUARD

Portable Circular Saws

CHECK:

- Switch
- Blade
  - Sharp
  - Type & Size for Application
- Blade Guard
- **Power Cord**
  - **Out of Blade Path**

Portable Circular Saws

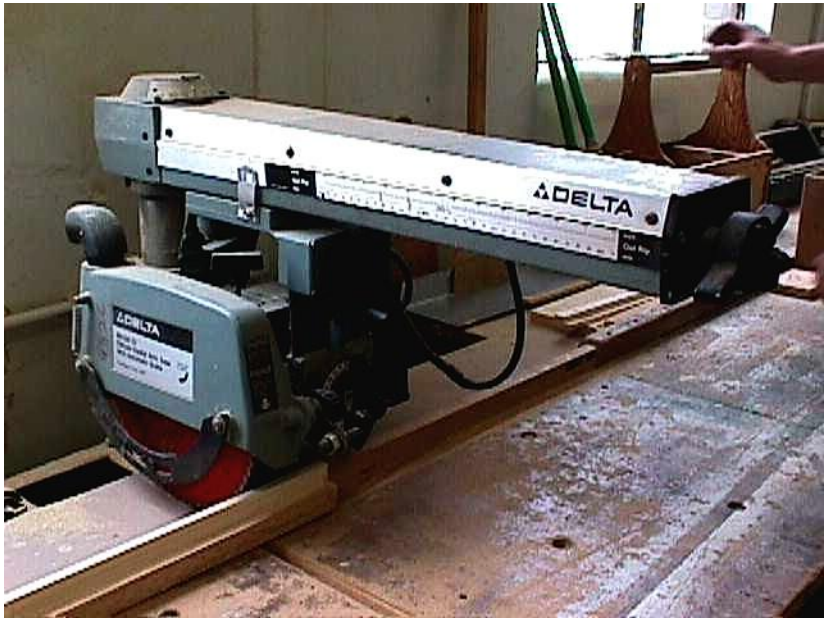
Set Blade Depth
1/8” > Work

Clamp Work Piece

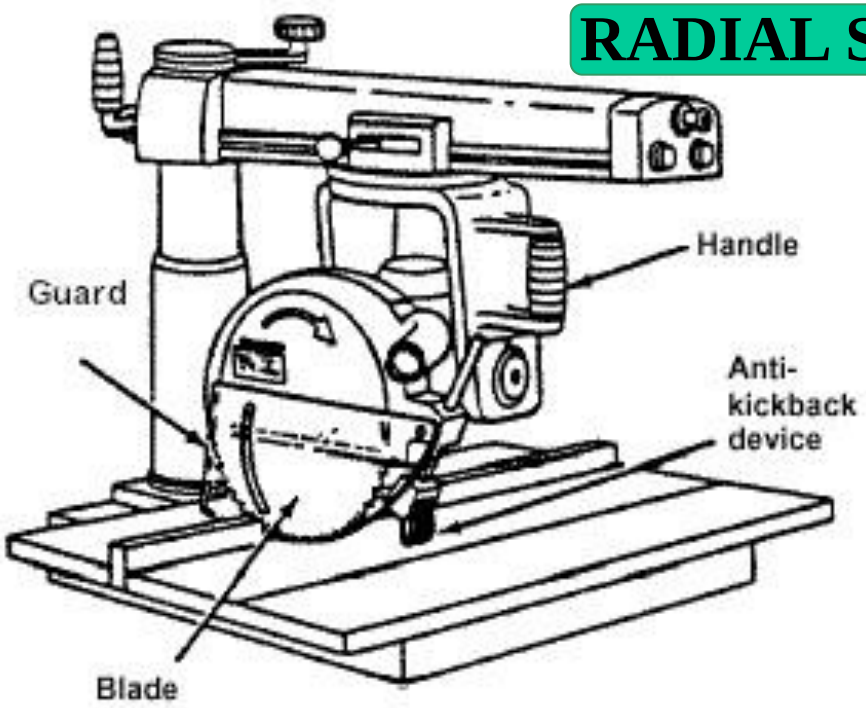
Hold Saw Firmly
With Both Hands

Cross Cut

Rip Cut



RADIAL SAW

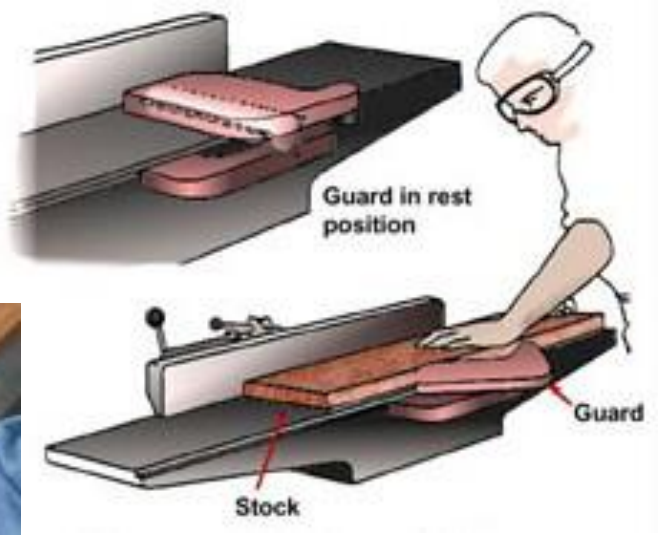


COMPOUND MITER SAW

or CHOP SAW

Cutter Head
< 1/8”

Jointers

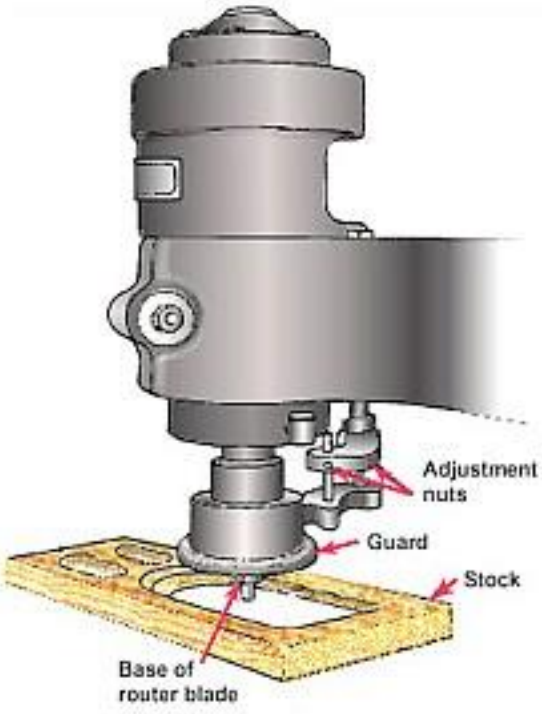


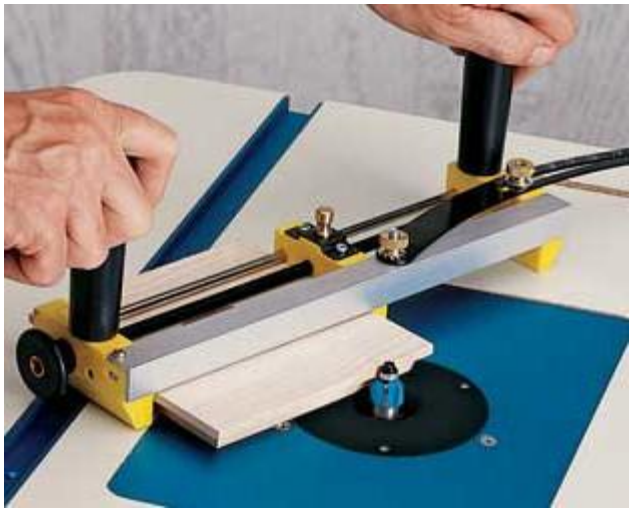
Planers

Make Multiple Planes
1/16” at a Time
Until Desired Thickness

Router

Jig & Push Stick





Small Piece Holder

Router

Drills

Drill Safety Precautions

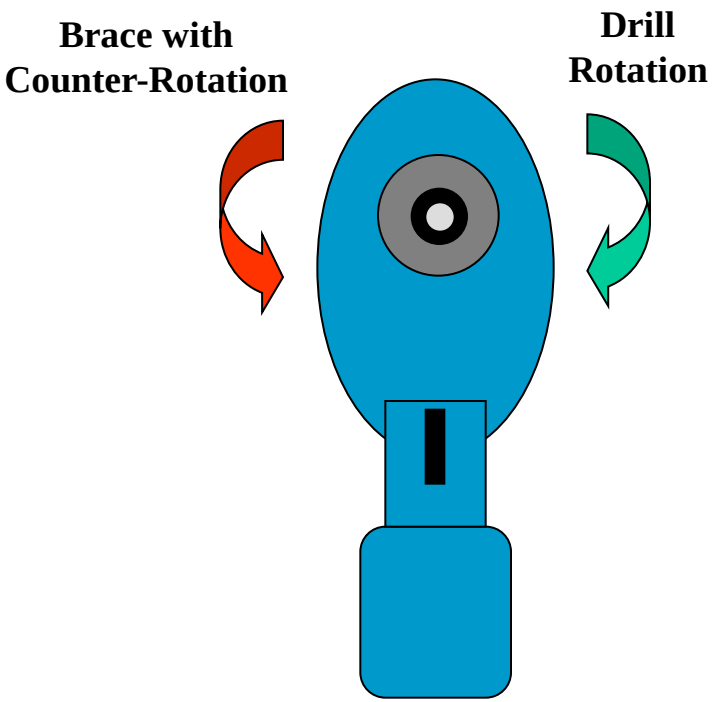
- **Secure Chuck**
- **Tighten Bit**
- **Remove Chuck Key**

Chuck & Key

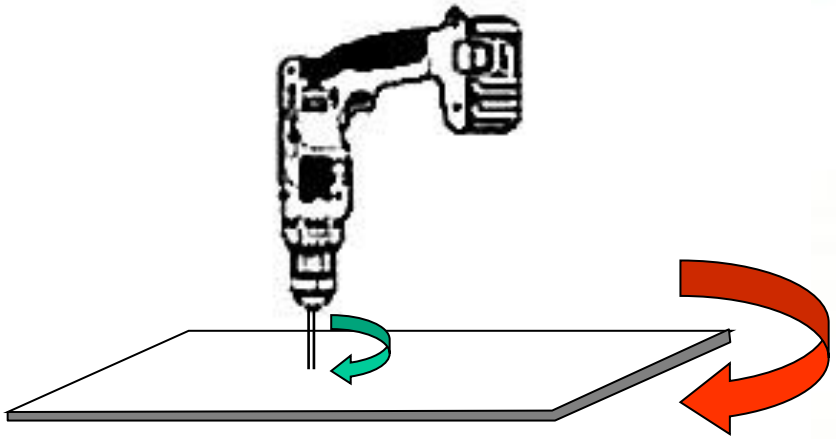
Bits

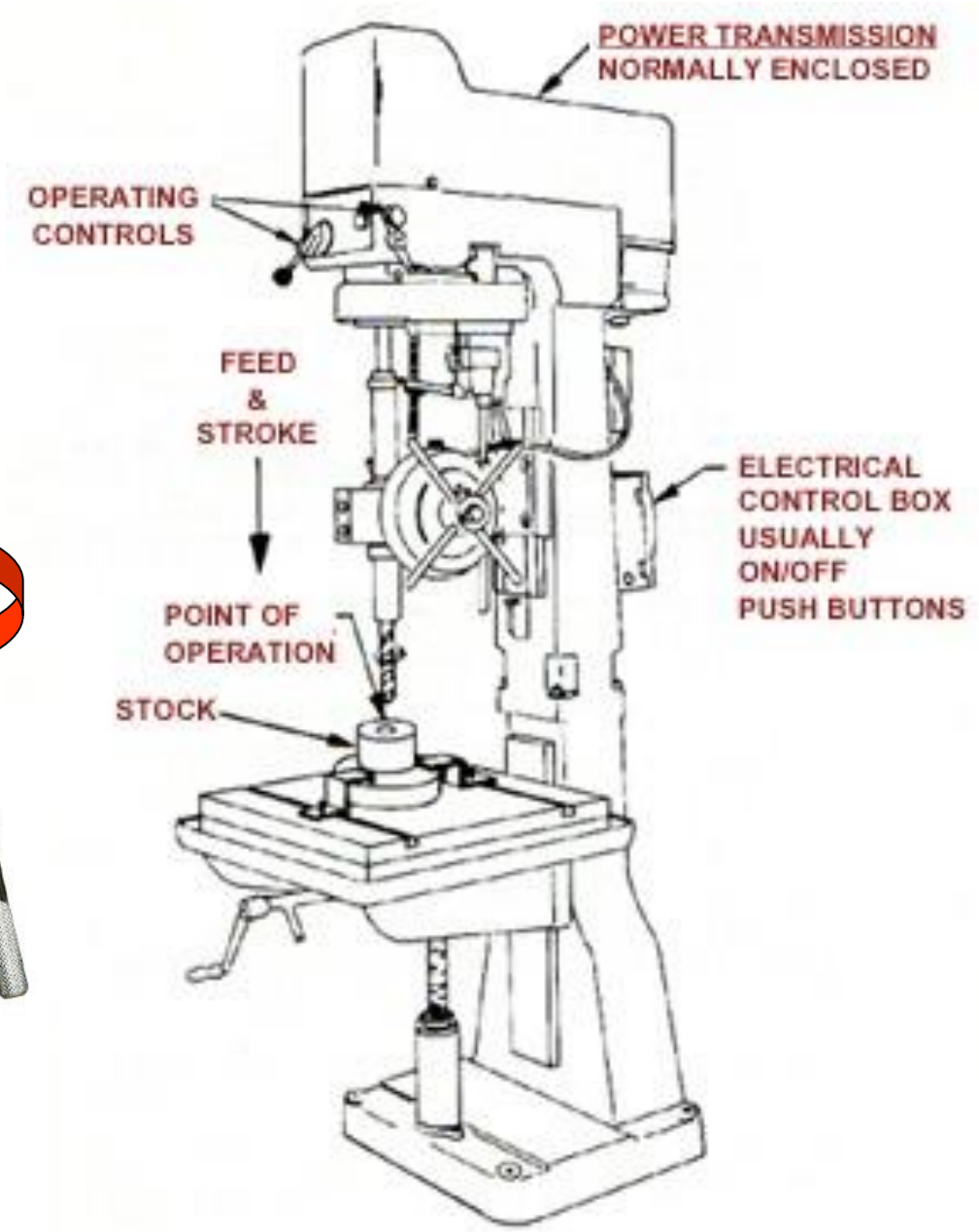
Drill Safety Precautions

- **Auxiliary Handles Provide Added Control**
- **Brace in Opposite Direction or Rotation**
- **Don't force a drill**
- **Keep Switch Un-Locked**



Drill Safety Precautions





Hold Workpiece

- **Clamp**
- **Vise**
- **Jig**

Drill Safety Precautions

Self-Made Guard for Power Transmission

Point-of-Operation Guard

Pneumatic Tools

- **Powered by Compressed Air**
- **Main Danger - Getting Hit by Attachment or Fastener**
- **Eye Protection is Required**

Pneumatic Powered Tools

Positive Means of Securing Tool Prevents Accidental Disconnect from Hose or Ejection of Attachment or Fastener

- **Safety Clips or Retainers**
- **Nail Guns, Etc. With Automatic Fastener Feed (>100 psi) Shall Have a Muzzle Safety Device**
- **Airless Spray Guns >1000 psi Require Manual Safety Device**

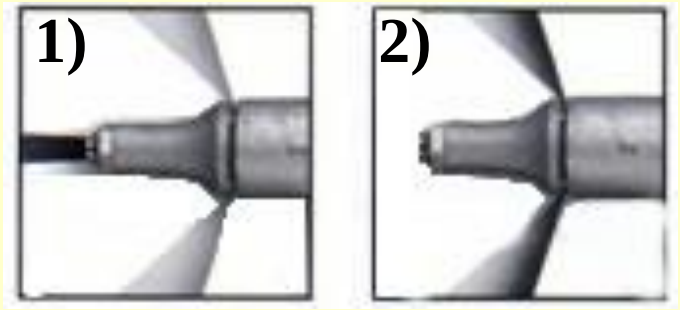
Do Not Point Tool or Air Hose at Anyone Or Allow Body Contact

Pneumatic Powered Tools

Cleaning with Compressed Air
Not Recommended
(Allowed < 30 psi)

- **Do Not Clean Yourself / Others**
- **If > 30 psi, Requires Nozzle to:**
  - **-Reduce to < 30 psi**
  - **-Protect Worker & Co-Workers**

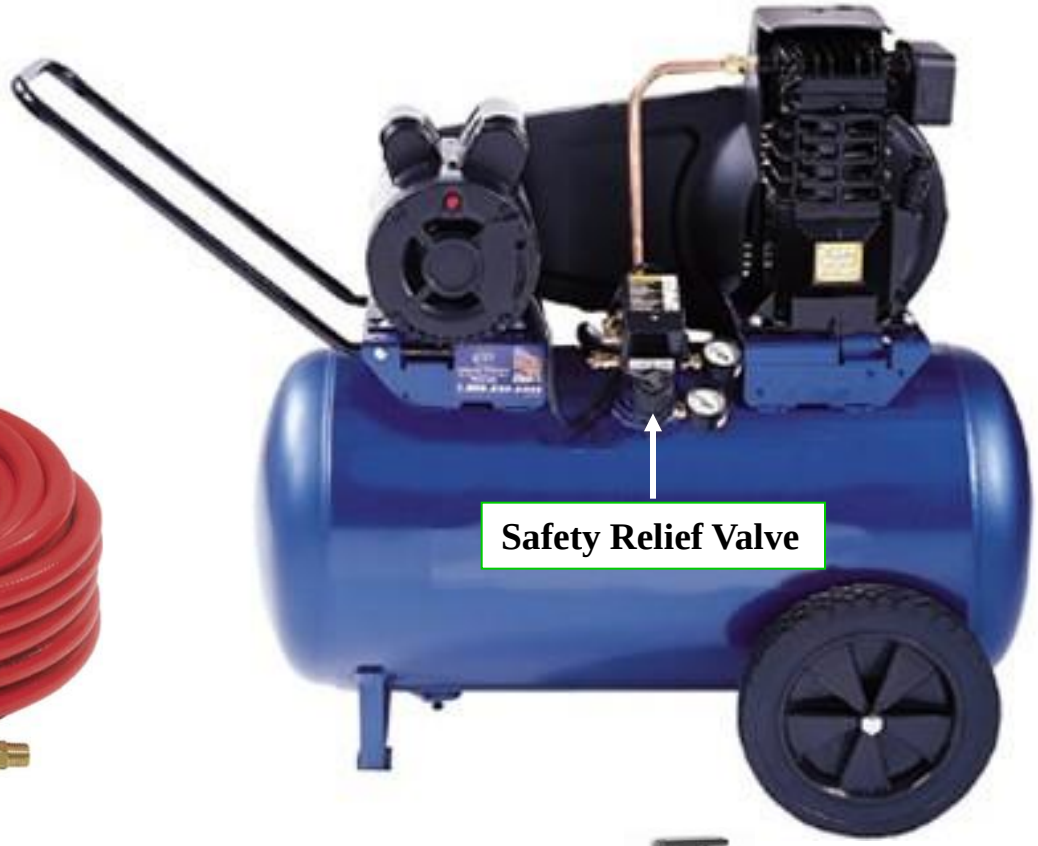
Chip Guard



1) Normal Air Flow Exits Nozzle with Protective Cone

2) Blocked Air Flow – Relief Air Flow Only in Protective Cone

Pneumatic Powered Tools



- **Prevent Hose Damage**
- **Tripping Hazard**
- **Use LOTO Before Service or Maintenance**
  - **-Turn Off Compressor**
  - **-Relieve Pressure (Use Valve; Do Not Kink Hose)**
  - **-Disconnect Hose From Tool**

In-Line Hose Connector & Lockout Device

Powder-Actuated Tools

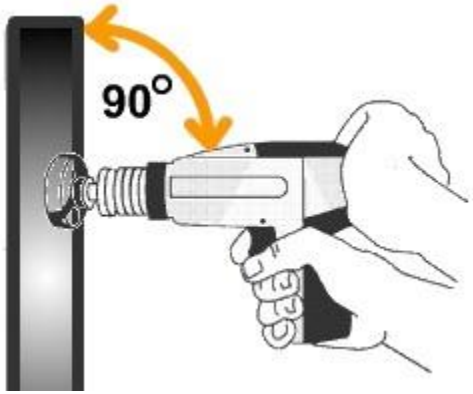
Fastens Materials to
Concrete, Masonry, Steel

SAFETY PRECAUTIONS:

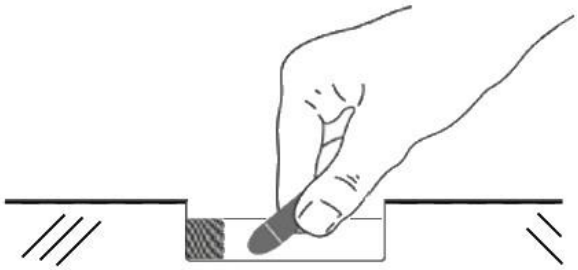
- **Respect Same As A Gun**
- **Wear Eye & Ear Protection**
- **Operator Requires Certification in Specific PAT**

Powder-Actuated Tools

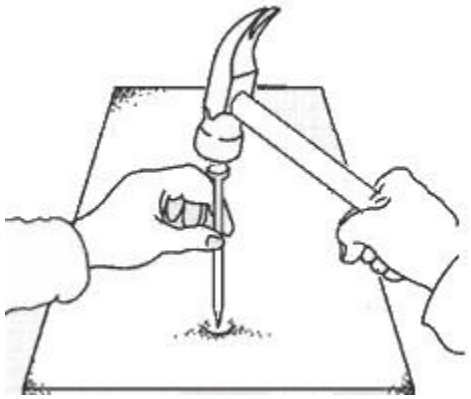
- **Keep Pointed Away from You & Others**
- **Carry Cartridges in Box (Not Pocket)**
- **Use PAT Fasteners (Not Ordinary Nails)**
- **Load Fasteners Before Powder Load**
- **Only Load Immediately Prior to Use**
- **Place Tool at Right Angle and Press Against Work Surface to “Shoot”**



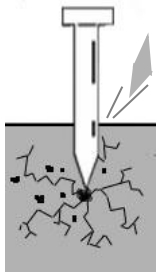
Compress Muzzle



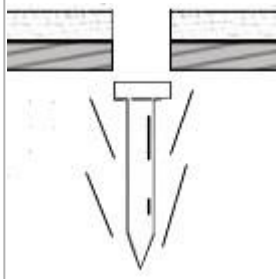
Powder-Actuated Tools



Punch Test



Too Hard
Brittle

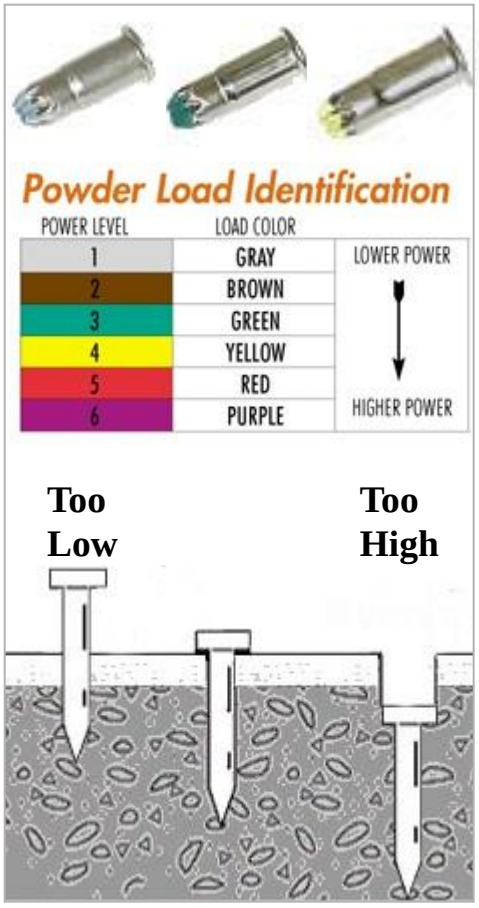


Easily
Penetrated

Flammable
Combustible
Atmosphere

Ventilation Required in Confined Space

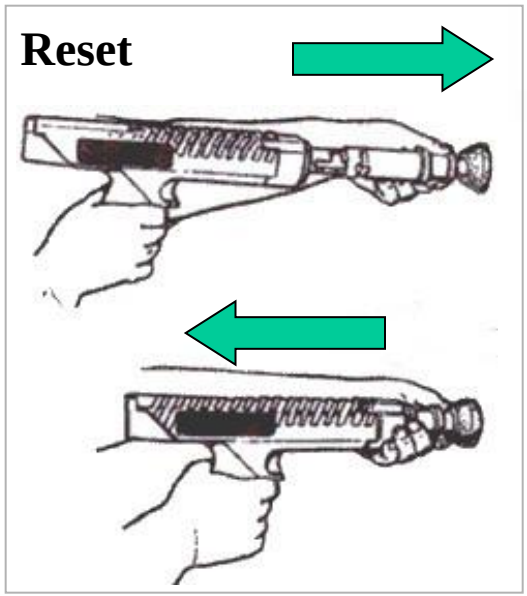
Use Spall Shield



Powder-Actuated Tools

***MISFIRE*:**

- **Hold Tool In Place 30 Seconds**
- **Try Firing Again**
- **Wait Another 30 Seconds**
- **Remove Cartridge**
- **Place In Water**



MAINTENANCE:

- **Ensure Not Loaded**
- **Follow Manufacturer's Instructions**
- **Keep In Locked Storage**

SC Budget and Control Board

Division of General Services

Tool Safety

BASIC SAFETY RULES

- Keep All Tools in Good Condition
- Use the Right Tool
- Check Tool for Damage
- Operate According to the Manufacturer's Instructions
- Use Proper PPE





Work Safely!